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EXAMINER

WERNER, DAVID N

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2621

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/540,217	Applicant(s) KAMIJO ET AL.	
	Examiner David N. Werner	Art Unit 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3,7,13-16,21,24-26,28,29,32-34 and 36-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15 is/are allowed.
- 6) ☒ Claim(s) 3,7,13,14,16,21,24-26,28,29,33,34 and 37-43 is/are rejected.
- 7) ☒ Claim(s) 36 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office action for U.S. Patent Application No. 10/540,217 is responsive to communications filed 22 April 2010, in reply to the Non-Final Rejection of 25 November 2009. Claims 3, 7, 13–16, 21, 24–26, 28, 29, 32–34, and 36–43 are pending.
2. In the previous Office action, Claims 3, 9, 10, 13, 14, 24–29, and 38–41 were rejected under 35 U.S.C. § 101 as non-statutory. Claims 3, 7, 9–16, 21, and 38–41 were rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent Application Publication No. 2003/0161399 A1 (*Ali*) in view of U.S. Patent No. 6,289,049 B1 (*Kim*) and in view of U.S. Patent 7,367,042 B1 (*Dakss*). Claims 24–27, 29, 32–35, 37, 42, and 43 were rejected under 35 U.S.C. § 103(a) as obvious over *Ali* in view of *Kim* and *Dakss* and in view of U.S. Patent No. 6,243,495 B1 (*Naveen*). Claim 36 was found to contain obvious subject matter but was objected to as dependent on a rejected base claim.

Response to Amendment

3. Applicant's amendments to the claims have been fully considered but are insufficient to overcome the rejections under 35 U.S.C. § 101. Applicant has amended the preambles of independent method claims 13, 38, and 42 to each recite that the respective methods are performed "using a processor" or "implemented using the processor". However, these amendments are not given any weight since they are in the claim preambles. In response to applicant's arguments, the recitation. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a

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process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). To properly overcome the rejection under 35 U.S.C. § 101, Applicant must further amend the claims to recite the processor actively performing at least what Applicant considers to be the inventive step in the claimed methods.

Response to Arguments

4. Applicant's arguments, see pages 17–19, filed 22 April 2010, with respect to claims 13 and 15 have been fully considered and are persuasive. The prior art claim rejections have been withdrawn. In particular, the claims now are clearly directed to a method and apparatus for segmenting a motion image into different regions or objects, the first segmenting step comprising producing an initial estimate of which blocks belong in which numbered regions each with an object identification code, performing a second estimate of which blocks belong in which regions based on the motion between the current frame and a different frame at a different time, and overriding or updating the first estimate with the second temporal estimate. Although there is known prior art concerning tracking moving objects in an image based on temporal-based segmentation, such as in the attached document *Moving Target Classification and Tracking from Real-time Video*, the claimed method of using the motion estimate as a

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"second estimate" for which blocks are in which numbered regions is novel-and non-obvious.

5. Applicant's arguments filed with respect to Claims 38 and 39 have been fully considered but they are not persuasive. Applicant discusses features of the claims and makes a conclusory statement that the features "are new and obvious over the prior art" and without disclosure nor suggestion in the cited references, but presents no argument or evidence to support this statement. Applicant is reminded that under 37 C.F.R. § 1.111(b), a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references is not acceptable.

6. Applicant's arguments filed with respect to Claim 42 have been fully considered but they are not persuasive. Applicant discusses a feature of the claim and makes a conclusory statement that the feature "is new and obvious over the prior art" and without disclosure nor suggestion in the cited references, but presents no argument or evidence to support this statement. Applicant is reminded that under 37 C.F.R. § 1.111(b), a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references is not acceptable.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claim 16 recites the limitation "the method according to claim 15" in the first line.

There is insufficient antecedent basis for this limitation in the claim. Claim 15 is an apparatus claim, not a method claim.

Claim Rejections - 35 USC § 101

9. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 3, 13, 14, 16, 24–26, 28, 29, 32–34, 38, and 40–42 are rejected under 35

U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The independent method claims each recite "a processor" in the claim preambles.

Although such a recitation of such a device would tie the claimed method to a particular machine in a way that would satisfy the requirements of *In re Bilski*, 545 F.3d 943, 960

(Fed. Cir. 2008) (*aff'd on other grounds sub nom. Bilski v. Kappos*, Case No. 08-964,

Jun. 28, 2010), the presence of the "processor" in the claim preambles is not sufficient.

A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190

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USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). It is suggested that the independent method claims be amended so that the "processor" actively performs at least the method step which Applicant believes to be the inventive step.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 3, 7, 38, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication 2003/0161399 A1 (Ali) in view of U.S. Patent 6,289,049 B1 (Kim et al.) and in view of U.S. Patent 7,367,042 B1 (Dakss et al.).

Regarding Independent Claim 38, figure 2 of *Ali* illustrates the claimed N consecutive pictures within a time-series of pictures. The combined teachings of *Ali*, *Kim*, and *Dakss* disclose the claimed process of step (a) of assigning the same identification code to adjacent blocks as needed¹. In step (b), *Ali* discloses determining a boundary of an object as a point in which two adjacent blocks have disparate motion vectors. *Ali* at paragraph 0017. This is the claimed step of determining if objects having two different identification codes are in contact with each other. *Ali* also discloses determining that two adjacent blocks are in the same object if they have similar motion vectors. *Id.* This is the claimed step of determining that correlation within a first object is above a predetermined value. In step (c), *Dakss* describes a "flood-fill" algorithm that allows a user to highlight a specified region in interactive viewing. *Dakss* column 24: line 50–column 26: line 51. This process may be done two-dimensionally, in which every pixel in a region is given the highlight color. *Id.* at 24:50–56. There may also be a three-dimensional fill, in which the pixels in a 3D "space-time" volume may also be filled, with the three dimensions being horizontal, vertical, and time. *Id.* at 24:56–25:17. In other words, a specified region is tracked throughout a plurality of frames. Figures 11A and 11B illustrate this process. At block N, every pixel in a region (r, c) is given a highlight color. *Id.* at 25:18–24. Using the tracking method, both the corresponding pixels in the same region at frame N+1 and frame N-1 may also be highlighted. *Id.* at 25:24–39. Then, the tracking of objects in *Dakss* may be backward, as required in element (c).

¹ The previous Office action, including the rejection of the prior version of Claim 13, describing the

Regarding Claim 3, from figure 19 and page 40, it appears that the correlation is a measure of relative speed of overlapped objects. For example, as shown in figure 19, object 1 is moving faster than object 2, and so a greater amount of it is visible from beneath object 2 at time t than at time $t-1$. From this, it seems that the correlation function may be a function of relative magnitude of motion, or speed. However, in *Ali*, as shown in figure 2D, two regions having "disparate" motion vectors, the foreground and background, have different speeds, with the foreground moving relatively quickly to the background. Then, the claimed algorithm is considered to be encompassed within the process of determining disparate motion vectors in *Ali*.

Regarding Independent Claim 39, *Ali* discloses the claimed "storage device" and "processor". As mentioned with respect to Claim 38 *supra*, the combined teachings of *Ali*, *Kim*, and *Dakss*, disclose step (a), *Ali* discloses step (b), and *Dakss* discloses step (c).

Regarding Claim 7, from figure 19 and page 40, it appears that the correlation is a measure of relative speed of overlapped objects. For example, as shown in figure 19, object 1 is moving faster than object 2, and so a greater amount of it is visible from beneath object 2 at time t than at time $t-1$. From this, it seems that the correlation function may be a function of relative magnitude of motion, or speed. However, in *Ali*, as shown in figure 2D, two regions having "disparate" motion vectors, the foreground and background, have different speeds, with the foreground moving relatively quickly to

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the background. Then, the claimed algorithm is considered to be encompassed within the process of determining disparate motion vectors in *Ali*.

13. Claims 24–26, 28, 29, 32–34, 37, 42, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Ali* in view of *Kim* and in view of *Dakss* and in view of U.S. Patent 6,243,495 B1 (*Naveen*). Regarding Independent Claim 42, *Dakss* discloses the claimed object map, as object mapping table 217 containing the UID values for the different regions. *Dakss* at column 11: lines 26–37. Then, the process of determining the similar motion vectors for the blocks within a region in paragraph 0017 of *Ali* is step (a). The forward and backward tracking of an object of interest in figure 11A and column 25: lines 19–38 of *Dakss* is the process of determining the region based on the motion vector and an object map as the region moves forward or backward in time in step (b). However, none of the cited references disclose the claimed step of using a weighted average of motion vectors with weight as a function of overlap. In *Ali*, a normal forward motion vector from the figure 2B frame at time t1 to the figure 2C frame at time 2 is the claimed "fast-forward motion vector". As previously mentioned, in the combined teachings of *Ali* and *Kim*, a pair of adjacent motion vectors having an absolute value difference greater than a threshold is considered to be a pair of "disparate" motion vectors in different regions according to paragraph 0017 of *Ali*.

Naveen teaches a method of segmenting or partitioning MPEG video. Regarding Claim 42, in *Naveen*, motion vectors are first obtained according to standard procedure.

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Next, the motion vectors are refined according to the weighted average of surrounding macroblocks, with the weight proportional to the overlap of the area of the surrounding motion-compensated macroblocks. *Naveen*, column 4: lines 43–47, column 6: lines 5–10. This is the claimed step of using a weighted motion vector average with the weight corresponding to the areas of overlapping blocks and the region of interest, or current block.

Ali, in combination with *Kim* and *Dakss*, discloses the claimed invention except for the weighted motion vectors proportional to overlap area. *Naveen* discloses using this weighing. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the present invention to modify the system of *Ali* to use the "refined" motion vectors of *Naveen*, since *Naveen* states in column 2: lines 39–44 that such a modification would enable the use of more high quality motion coding, particularly for video that is recorded or encoded at real-time but does not need to be played back live.

Regarding Claim 24, in *Ali*, motion vector determination is done blockwise. *Ali* at paragraph 0017. Then, the "region of interest" of step (a) of the parent claim that is the basis of the motion vector corresponds to one block, as required in claim 24.

Regarding Claim 25, in *Dakss*, a new mask containing the region maps is generated for each frame. *Dakss*, column 10: lines 62–64. Then, *Dakss* generates a new map for each frame. The motion backwards from frame N to frame N-1 in figure 11A is the claimed movement in the negative direction of the motion vector.

Regarding Claim 26, in *Dakss*, since a new mask is generated for each frame, it must always update the oldest object maps with a newest object map, as claimed.

Regarding Claim 27, in *Ali*, a normal forward motion vector from the figure 2B frame at time t1 to the figure 2C frame at time 2 is the claimed "fast-forward motion vector". As previously mentioned, in the combined teachings of *Ali* and *Kim*, a pair of adjacent motion vectors having an absolute value difference greater than a threshold is considered to be a pair of "disparate" motion vectors in different regions according to paragraph 0017 of *Ali*.

Regarding Claim 29, as discussed with respect to for example claim 9 *supra*, in *Ali* and *Kim*, the process of segmenting a picture into objects or regions based on the absolute value of difference of motion vectors is the claimed process of determining of the absolute value of the difference is more than a threshold value. Two adjacent frames are at time t1 and t2, with the "interval of time" as the temporal distance between the two adjacent frames.

Regarding Independent Claim 43, as mentioned with respect to Claim 15 *supra*, *Ali* discloses the claimed "storage device" and "processor". As mentioned with respect to Claim 42 *supra*, the combined teachings of *Ali* and *Dakss* disclose the process of steps (a) and (b) and *Naveen* discloses the claimed process of using the weighted motion vectors.

Regarding Claim 32, in *Ali*, motion vector determination is done blockwise. *Ali* at paragraph 0017. Then, the "region of interest" of step (a) of the parent claim that is the basis of the motion vector corresponds to one block, as required in claim 32.

Regarding Claim 33, in *Dakss*, a new mask containing the region maps is generated for each frame. *Dakss*, column 10: lines 62–64. Then, *Dakss* generates a new map for each frame. The motion backwards from frame N to frame N-1 in figure 11A is the claimed movement in the negative direction of the motion vector.

Regarding Claim 34, in *Dakss*, since a new mask is generated for each frame, it must always update the oldest object maps with a newest object map, as claimed.

Regarding Claim 37, as discussed with respect to for example claim 9 *supra*, in *Ali* and *Kim*, the process of segmenting a picture into objects or regions based on the absolute value of difference of motion vectors is the claimed process of determining of the absolute value of the difference is more than a threshold value. Two adjacent frames are at time t1 and t2, with the "interval of time" as the temporal distance between the two adjacent frames.

Allowable Subject Matter

14. Claim 15 is allowed.

15. Claims 13, 14, 21, 40, and 41 would be allowable upon actions that would obviate the rejection under 35 U.S.C. § 101.

16. Claim 16 would be allowable upon actions that would obviate the rejections under 35 U.S.C. §§ 101 and 112.

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17. Claim 36 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

18. The following is an examiner's statement of reasons for allowance: As Applicant mentioned in the *Remarks* and for the reasons discussed above in the "Response to Arguments" section, Claim 15 is directed to an apparatus that performs a novel and non-obvious video segmentation.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance".

19. The following is a statement of reasons for the indication of allowable subject matter: Claim 36 is directed to a novel and non-obvious process of segmenting images based on clustering histograms of motion vector speeds of blocks and detecting different peaks in the histograms, the peaks corresponding with different regions, as illustrated in figure 26.

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent Application Publication No. 2003/0086490 A1 (*Horl*) teaches a video segmentation system that updates which "reference object region" is used as the temporal reference for a region in a current frame.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to David N. Werner whose telephone number is (571)272-9662. The examiner can normally be reached on Monday-Friday from 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. N. W./
Examiner, Art Unit 2621

/Mehrdad Dastouri/
Supervisory Patent Examiner, Art Unit 2621